NASOTRACHEAL INTUBATION

Introduction

Management of airway, ventilation, and oxygenation in the critically ill patient is a primary function of the paramedic. Intubation is often indicated in such patients, but occasionally it cannot be accomplished by the oral route. Nasotracheal intubation is a valuable alternative procedure to provide optimal respiratory management in some of these cases.

Nasotracheal intubation requires both skill and patience to perform correctly. It is frequently more time-consuming than orotracheal intubation. Nasal intubation can have serious complications including epistaxis, sinusitis, and increased intracranial pressure. It should be reserved for the critically ill patient who has failed to respond to conventional airway and pharmacological interventions.

Indications

1. Breathing patients requiring intubation where direct visualization of the posterior pharynx is difficult or impossible, e.g., the inability to open the patient's jaw or blood or emesis in the airway obscuring direct visualization of the vocal cords, OR
2. Breathing patients with severe respiratory distress indicated by decreasing level of consciousness, cyanosis, ineffective or decompensating respiratory effort.

Contraindications

1. Apnea
2 Suspected epiglottitis characterized by a sore throat, fever, and drooling
3. Pediatric patients weighing less than 30 kg (8 years old). This group of patients is best managed with orotracheal intubation or bag-valve-mask ventilation.

4. Suspected mid-facial fractures or suspected basilar skull fractures indicated by head or facial trauma with nasal hemorrhage, periorbital ecchymosis or swelling, hemorrhage from ear canals, or maxillary bone deformity and instability.
5. Head injury
6. History of bleeding disorders or current anticoagulation therapy with agent such as warfarin (Coumadin).
7. Penetrating neck trauma or suspected laryngeal injury due to blunt trauma

Complications

1. Unrecognized esophageal intubation with subsequent hypoxic brain injury
2. Nasal bleeding
3. Turbinate avulsion
4. Nasopharyngeal or retropharyngeal laceration
5. Injury to vocal cords, epiglottis, or other airway structures
6. Vomiting and subsequent aspiration
7. Sinusitis, otitis media, bacteremia

Protocol

1. Begin preoxygenation with 100% O_2 prior to the procedure. If the patient is conscious, explain what is about to happen. Ensure that the scene is calm enough to hear the air exchange when advancing the tube.
2. Consider procedural sedation using midazolam (Versed) 5mg/1mL IN (atomized) into nare not being using for intubation.
3. Administer lidocaine 1% 20mg/1mL IN (atomized) into nare that will be utilized for nasotracheal intubation.
4. Instill phenylephrine HCL 0.25% or oxymetazoline 0.05%, two or three drops or sprays into both external nares. Early installation allows adequate time to effect vasoconstriction of the nasal mucosa.
5. Administer a spray of benzocaine or lidocaine into the posterior pharynx, if possible, to reduce the gag reflex.

6. Lubricate a nasopharyngeal airway with 2% lidocaine gel or 2% lidocaine viscous and insert it into the larger nare. This will anesthetize the nare while the remaining equipment is assembled.
7. Prepare suction. In addition to vomiting, bleeding in the posterior pharynx may occur due to insertion of the endotracheal tube.
8. Choose an endotracheal tube. The primary criterion for tube size is the nasal canal diameter. Often a 7.0 mm tube is the best size for adults. Rarely a tube less than 6.5 mm will be necessary. ET tubes with attached pull-rings (Endotrol) are preferable for the procedure.
9. Aggressively press the 15 mm adapter into the tube end. It is extremely difficult to re-affix the adapter after the tube has been placed. Attach a 10 ml syringe to the cuff inflation valve and check the cuff for air leak. Remove the stylet from the tube if it is in place. A lighted stylet with the internal wire removed may be placed into the tube to assist endotracheal tube placement.
10. If a lighted stylet is not used, consider attaching the air flow whistle to the adapter end of the ET tube. This will assist detecting air movement as the tube is advanced into the trachea.
11. Lubricate the endotracheal tube with 2% lidocaine gel or 2% lidocaine viscous.
12. Position the patient with head in midline, sniffing position. Use neutral neck position with a cervical immobilization collar in place if cervical spine injury is suspected. The patient may be in a sitting or upright position; patients in severe respiratory distress should be intubated in the upright position. Remove the nasopharyngeal airway from the selected nare.
13. With gentle steady pressure, advance the tube perpendicular to the facial plane through the nare to the posterior pharynx. The beveled edge of the tube is placed against the nasal septum to reduce the risk of bleeding. Advancing the tube tip along the nasal floor avoids the turbinates and reduces the incidence of epistaxis. Never force the tube. If resistance is felt, the tube could be dissecting under the nasal or pharyngeal mucosa. Withdraw the tube part way, redirect, and advance again with gentle steady pressure.

14. Keeping the curve of the tube exactly midline, continue advancing slowly while listening to air movement and watching for condensation in the tube. When the tube tip is nearest the trachea, air movement will feel the strongest and sound the loudest. It may be helpful to obstruct the mouth and the opposite nare.
15. A slight resistance may be felt just prior to entering the trachea. At the onset of the next inspiration, advance the tube into the trachea with a quick, controlled movement. Usually the first sign of correct passage is a violent cough. Advance the tube approximately one inch further and then inflate the cuff.
16. If the patient develops laryngospasm or if the tube enters the esophagus, withdraw the tube slightly. Reposition the tube tip above the level of the cords and wait until the patient repeats inhalation. Re-attempt tube advancement. Application of cricoid pressure may assist successful passage of the tube into the trachea.
17. If positive pressure ventilation with the bag-valve device produces sounds of air leakage around the cuff, check the cuff inflation and the tube placement.
18. Verify tube placement with visualization, auscultation and capnometry/capnography. Continually monitor capnometry/capnography
19. Ventilate and auscultate for bilateral breath sounds in the axillae and for the absence of ventilatory sounds in the epigastrium.
20. If tube placement cannot be verified remove tube and prepare for another attempt.
21. Sedation with midazolam (Versed) 1-5 mg IV/IO titrated up to a max dose of 0.1 mg/kg may be performed prior to second attempt with the following conditions:
    A. Titrate dose to decrease patient agitation keeping in mind that spontaneous breathing is required for this procedure. Precautions must be taken in the event sedation results in apnea.
    B. Systolic blood pressure is ≥ 100 mmHg
    C. The assembled team must include personnel capable of RSI in the event of apnea.
22. Secure the endotracheal tube, note the depth in cm at nare, and apply soft restraints to prevent extubation.

23. If the patient requires **sedation** after intubation:
    A. Administer midazolam (Versed) 1-5 mg IV/IO titrated up to a max dose of 0.1 mg/kg. Systolic B/P must be ≥ 100 mm Hg.
    B. If systolic blood pressure is ≤ 100 mmHg, administer lorazepam (Ativan) 1 mg IV/IO diluted 1:1 with 0.9% NS.